

The body can heal itself in trauma: concept and practical exercises

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Abbreviations

PTSD, post-traumatic stress disorder; HRV, heart rate variability; QoL, Quality of Life; TRE, Tension release exercise.

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Abstract

Post-traumatic stress disorder is caused by a traumatic experience, for example rape, a natural disaster, war, serious accidents. Memories of the trauma often haunt the affected person in everyday life. Anyone who has to survive one or more such extreme situations can suffer from post-traumatic stress disorder, even witnesses of a traumatic event [1]. If the disorder is not treated, it can become chronic and massively limit the quality of life. With timely and correct therapy, the chances of recovery are good. In the experience and psychological processing of those affected, there is a difference whether this catastrophe was a natural disaster or a “man made disaster” in a war or post-war area. It becomes very difficult when the two come together, as for example in Banda Aceh in 2004. The associated individual experience of fear of death, panic, helplessness, loss of control and powerlessness is the same for both types of disaster at the moment it happens. However, the processing of the traumatising experience is different. Traumas caused by people are more difficult for the individual to process than natural disasters. The article describes in detail what happens in the body and in the person during traumatising. It also describes how the body can heal itself. The second part of the article presents the concrete exercise programme for practice.

Keywords: trauma; self-regulation; stress-reaction; neurogenic tremor; psoas-muscle; vagus-nerve; resilience

Introduction

This article provides an introduction to a novel psychotherapeutic approach to working with trauma and post-traumatic stress disorder (PTSD). This approach is primarily based on the theories and concepts developed by Peter Levine, Alexander Lowen, Pat Ogden, Stephen Porges, Robert Schleip and other pioneers of body psychotherapy/somatic experiencing/bioenergetic analysis [1–5]. The article is primarily intended as a presentation of a praxeological approach and less as an overview or critical appraisal of the literature on the topic of traumatisation or PTSD. For reasons of space, this must be left to another paper.

At this point, it should be emphasised that the presented approach has been successfully applied in numerous countries and with very different target groups [6]. The approach is understood as a self-help concept. Since the work originally deals with the (semi-)autonomous body processes and the self-regulation associated with them in a very specific way, as will be explained later, it offers a suitable, sensually tangible and helpful way of working with the consequences of trauma and PTSD.

It is precisely this aspect that makes it possible to work with people who are in a traumatising development (e.g. after an earthquake, in a war zone, lockdown, etc.). The approach presented here also makes it possible to work with the psychophysical effects of PTSD in a body-related way afterwards. This is particularly useful and necessary when other approaches (depth psychology-based psychotherapy, behavioural therapy, etc.) reach their limits. In this respect, the present body-psychotherapeutic approach is not to be understood as an alternative to these methods, but as complementary and integrating. This body-based approach is particularly helpful and indicated when the traumatised people or those suffering from PTSD are not (yet) accessible linguistically.

At this point, it should also be mentioned that the central effects of traumatic development or PTSD on the organism are basically the same physiologically. See also the comments below on the function and significance of the psoas muscle and the relevance of autonomic body reactions such as tremor.

The body-based approach presented here is relevant in so far as it enables access to non-linguistic, psychological content and experience. This happens on the one hand through the direct work with the body and the associated support of (semi-)autonomous bodily processes such as trembling, vibrating, tremor etc. and on the other hand through the subsequent therapeutic conversations or psychoeducational support. Traumatic experiences have a profound, unconscious, formative influence on the body. The effects are stored in the so-called body memory and are usually only accessible or treatable through language to a very limited extent. Working with trauma and PTSD therefore requires a body-based therapeutic approach [1, 7, 8].

It has been hypothesised that neurogenic tremors are an innate adaptive mechanism by which the human organism can restore homeostasis [1]. Neurogenic tremors are described by Levine as the natural, reflexive and vibratory action of muscles in response to stressors and are a function of the autonomic nervous system [1]. They originate in the sympathetic nervous system and if activated help discharge the pent up energy in the sympathetic nervous system in order to restore parasympathetic nervous system functioning and calm, once the stressful situation or stressor has abated.

The concept of organismic self-regulation described here primarily highlights the practical application, the neurophysiological justification and the organismic effects. This is done with reference to current research results. In these, the fact that the method presented here primarily serves to reduce personal stress and improve QoL is particularly emphasised. The more clearly the effect in this regard can be felt and experienced, and the better the feeling of everyday life (QoL), the better one's own behaviour in the sense of practical stress management.

What is the immediate impact of trauma?

We call experiences traumatic that are accompanied by feelings of absolute helplessness and powerlessness [8]. The associated affects of fear of death, panic, despair, disgust, complete loss of control lead to overstimulation, overexcitement and overload of the central nervous system. Acting appropriately to the situation is no longer possible, the normal coping mechanisms of the psyche fail. These traumatic experiences cause a profound shaking of the understanding of the self and the world. The personal basic assumptions about the world that have determined one's own actions are invalidated. Social identity becomes fragile, self-confidence declines. One no longer knows one's way around the world.

One of the involuntary coping strategies of the traumatic shock is the so-called dissociation. This means that the person unconsciously detaches himself from the present situation so that he no longer perceives his surroundings so intensively—this is also called a shift in consciousness. The person is no longer as present as usual. The majority of those affected remain capable of acting during such phases of dissociation. Dissociation can lead to the memory of traumatic moments being impaired or even erased. In people with PTSD (post-traumatic stress disorder), dissociation states can also occur much later and repeatedly in the sense of a disease symptom. Some PTSD patients dissociate involuntarily as soon as they are reminded of the traumatic experience, because the mere thought of the most horrific moments is unbearable. Shock can manifest itself in different ways. Some people freeze and cower motionless on the floor, others are so agitated that they cannot stop running around and screaming. The majority of these reflexive shock reactions cannot be controlled. They are created by the body as a protective reaction [9].

One can imagine that the stress hormone system of the body goes crazy during bad events; among other things, there is an enormous release of adrenaline over an unusually long period of time. As a result, one can hardly sleep or eat and is excited all the time, almost on the run.

The stress reaction (e.g. fight, flight, numbness) is a normal, biological, physiological process in the body. If this reaction occurs as a result of traumatisation, this stress reaction is preceded by an automatic physiological process. Recent research shows that the vagus nerve signals to the organism whether a (traumatizing) event is dangerous or not. The vagus nerve basically controls the reaction of the sympathetic and parasympathetic nervous system. This in turn is the basis and trigger for the physiological stress reactions.

The physiological state in which the autonomous nervous system reacts depends on the degree of physical security experienced, which in turn is registered by neuroception. This refers to the process of perception as to whether an environment, a person or an event is harmless, dangerous or even life-threatening. This perception “takes place in the primitive areas of the brain without us becoming aware of it” [4].

It is therefore a perception that is fed by organs, tissues and bones. This kind of traumatisation can also happen when one only directly witnesses such an event.

How can you recognise PTSD?

There are two types of reactions or a combination of both in people who experience trauma. Some are in a state of hyper arousal with the typical symptoms such as sleep disturbances, anxiety attacks, nervousness, over-excitedness, fits of rage, weight problems. The others fall into a state of torpor (hypo-arousal). Then other symptoms appear, for example dissociation (splitting off), depression, isolation or loss of contact with one's own body. Basically, the traumatised person finds himself in a situation that massively overtaxes him. He cannot react appropriately. An overwhelming feeling of helplessness is triggered.

The process in the organism can be understood as a trauma cycle (Figure 1). The experience perceived dangerously via the vagus nerve intervenes deeply in the entire organism and is psycho-physiologically anchored there. When new, triggering experiences occur, this process is automatically triggered and repeated. In this respect, the entire

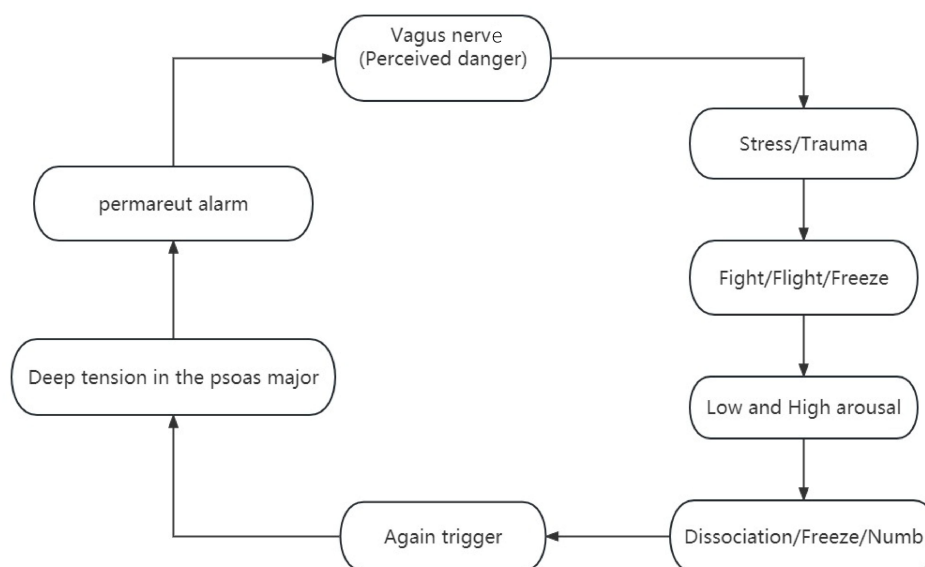


Figure 1 Trauma cycle in the body. Integration of body and mind into psychotherapy and mental health. Curriculum body-work in the field of mental health (Work results August 2016, Training curriculum at the Shanghai Mental Health Centre).

organism is constantly in a permanent state of alarm.

The event itself is only secondary. In bodywork we work with what happened in the nervous system. For us, it is much more crucial to restore the balance in the nervous system than to pay attention to the story that led to the trauma [6]. It is about the body regaining the capacity for organic self-regulation. As long as we are not traumatised, we can cope with life's difficulties and release tensions in a natural and normal way. We come home after a hard day, see our partner and are able to relax. In trauma, the mechanism of tension and release is disturbed. The tension remains but cannot be released naturally.

Relaxation is not enough

No, that is exactly what does not work. Only by working with one's own resources can tension and excitement be released. In this way, a relaxation reaction occurs. That is a very important point. There are many therapies that try to make patients relax. But traumatised people cannot relax properly. On the contrary, when they try to relax, the anxiety often becomes even stronger.

Our body is our healer. Through it, traumatised people get their strength back. We don't give any impulses from outside and we don't lead the clients on a fantasy journey. In the course of our work, everyone realises that the answer to their problem lies in their own body. By strengthening his or her resources, for example, we merely create the conditions that help the client to perceive the response of his or her body and to bring its expression to a conclusion. We don't know what this response will look like at the beginning of the process. But it is inside every human being.

Our work is always about finding the answer in the body [10]. So when the client talks about his resources, I try to find out if it really helps him to discharge the pent-up energy. If this is the case, it is a matter of the patient himself feeling how his body reacts and the tension in him is released. So I ask him, "What is happening in your body right now when you think of that situation when you saw your wife again?" Then he says, for example, "My body feels softer and much lighter." And so I continue to keep track of this discharge process. This is, of course, a favourable case.

The body heals itself

The point is to restore the body's self-regulation. This means that the body can have the energy it needs to face the challenges of life. And

that it can discharge the energy it doesn't need after it has mastered the challenge and relaxes again. That there is alertness and wakefulness on the one hand and the ability to relax on the other. Only when the nervous system is in natural balance is it possible to be completely in the here and now. It is about helping the client to return to the body [11].

The Power of involuntary body reactions: neurogenic shaking

In the course of applying the sequence of exercises, it has been clearly shown that the vibrations produced have an effect on the diencephalon via the nerve pathways and, through the repetition of states 'experienced', i.e. 'remembered', in the body, bring about a resolution (release, discharge) without the trauma having to be called into consciousness i.e. repeated. People who allow and experience the neurological tremor after a traumatic experience are soon able to control and use their body again [6]. They recover physically and mentally much faster than people who suppress tremors or block them with medication.

These involuntary movements also make it possible for the metabolism to break down the excess of substances released more quickly.

You can help yourself with these exercises [11, 12]. Anyone can learn them. When you start with the exercises, you can always pause for a moment and feel how and where anxiety 'feels'. In the stomach? In the throat? Does the heart beat faster? Do you breathe differently? Do the joints become stiff? Does one get cold or hot from the inside? Which muscles contract? What happens in your face? What exactly is happening in your body so that you know "I am afraid"?

Why is this so important? Fear increases when we no longer listen to our body, no longer understand its signals, suppress them permanently and vehemently or rationalise them? Fear is always associated with unconscious muscle tension and the release of endogenous substances that change the metabolism and organ functions. Depending on the intensity and duration of the experience, it takes a long time for muscles and body chemistry to return to normal. In this normal state, the relaxed muscles and the absence of stress hormones signal to the brain that there is no longer any danger. But what happens when the acute fear turns into chronic 'worry' or 'apprehension' and the constant mental return to the event or the projection of a fear into the future creates permanent stress?

It is possible to overcome traumatic experiences and recover

without lengthy, expensive, expert-assisted therapy. Post-traumatic disorders are physiological and the psychological effects are “only” symptoms. And: The body has its own, automatic and infallible method of releasing the inner tensions and returning to normal, if you let it. This is the basis of the exercise concept of involuntary muscle reactions. The neurogenic trembling caused by the easy-to-learn exercises is the natural reaction of a healthy body to traumatically induced tension.

In this respect, the exercises are not a rational or psychological approach, nor are they pure relaxation exercises. The only requirement for successful application of the exercise sequence is the mental willingness to let the body “do what it wants” [13]. Hard enough for some people who find it easier to learn complicated dances than to tolerate their legs temporarily shaking ‘uncontrollably’. But those who have understood that they can trust their own body to bring themselves back into order will be grateful to have found a method with the exercises that is easy to learn and with which one can help oneself anytime and anywhere. After traumatisation, under stress or when you want to shake off the burdens of everyday life again.

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A physical reaction to traumatic experiences all over the world is the same—it is a neurologically induced ‘tremor’, ranging from mild to severe, always starting in the legs and lower back and pelvic area. Many people in other parts of the world ‘experience’ this reaction as ‘normal’ and do not suppress it, in the western world it is often suppressed or even prevented and suppressed with the administration of medication [6].

This reaction, this trembling, is a ‘self-healing’ of the body. The neurologist Deuschl, one of the leading scientists in the field of

international tremor research, confirms that there is experimental evidence that the psychological tremor (trembling) of the healthy is usefully in movement control. One could say that tremor is a genetically based discharge caused and controlled by the central nervous system. We have developed a series of exercises that induce exactly this ‘tremor’. It works for everyone, no matter how old or from what part of the world.

These exercises first trigger an acute or chronic muscle spasm in the psoas muscles [5]. We cannot consciously control this muscle group, it sits around the pelvis and lower back and takes care of a lot of important things: walking upright, straight shoulders, optimal position of the legs and spine. Not only do we ‘use’ this muscle group completely unconsciously, we also perceive its tension only indirectly. The ‘trembling’ caused by the (light) exercises begins in the thighs and pelvic area, but continues with increased application of the method and encompasses the shoulders and arms, the legs and feet. A loosening and realignment of the whole body begins. Surprised and amazed, most people see that the body has an accurate ‘memory’ of traumatised areas and ‘sends’ the involuntary movements (tremors and others) first precisely to the more stressed areas (surgical scars, old injuries of any kind, the sources of chronic pain or tension). While the way of trembling is not controllable you can still interrupt or stop it at any time if you want to. And after a maximum of fifteen minutes, it usually subsides and stops on its own.

Unresolved post-traumatic symptoms can destroy a person’s identity as well as their entire belief system. The revolutionary insight now: Our body knows a much better, faster and painless method to free itself and subsequently also the ego from the after-effects of trauma.

The body, as a living organism, is biologically designed to rid itself of anything that impedes growth and normal functions. An instinctive natural mechanism, genetically predetermined, facilitates our letting go deep within the organism, thus ensuring our existence and further development. The mechanism the ‘neurogenic tremor’, an involuntary and uncontrolled shaking movement—is part of the overall development of all living beings and is active in mammals and all humans regardless of age, race and culture. To allow the body to do this healing work we must give up the resistance of the ego and allow the biological instincts to take over, when this succeeds we gradually feel liberation—a return of the life force within us.

The psoas and why it is so important

The physical exercises are about physiology, about what has been proven (and can be felt naturally) to go on in the body under stress and in traumatic situations. The ‘great lumbar muscle’ (musculus psoas major) plays an important role in this and it is worth understanding. In the inner centre of our body is an extensive muscle that affects virtually every aspect of our health, its name is the psoas or ‘great lumbar muscle’. It is responsible for the balance and alignment of the skeleton and the mobility of the joints, it affects blood circulation, organ function and diaphragmatic breathing. It is the only connection between the lumbar vertebrae and the legs and its movements massage the lower spine, viscera and internal organs with every step.

The psoas is connected to the twelfth thoracic vertebra and all five lumbar vertebrae. (Schleip 2015) It runs through the pelvis and ends at the femoral ring of the two thigh bones. The psoas and the iliacus connect to form a muscle group called the iliopsoas.

The length and flexibility of the psoas is to create ‘space’ in the middle of the body and is also a strong protector. Its diagonal structure supports the internal organs of the lower body, and a thick nerve cord runs along and through it from its upper end. The diaphragm and psoas together act as a hydraulic pump whose activity massages the internal organs and viscera and ensures the flow and even distribution of body fluids.

A healthy psoas acts like a tension wire between the lower body and the legs. Just as tension wires guarantee the stability of a circus tent but have no weight to bear themselves, the psoas responds to every movement of the spine. Ideally, it only transfers weight from the

upper body (one unit) to the legs (two units). But when the pelvis is unstable or out of balance it must intervene and provide stability. If the psoas is chronically 'abused' in this way, it can lose considerable mobility and strength and even shorten over time.

The psoas and stress

All humans are equipped with the same uncontrollable, instinctive reflexes in dangerous situations, which briefly override or at least strongly influence conscious, controlled action. In a moment of danger when the senses recognise a situation as a threat - it is the psoas that enables flight or fight. If this is not possible, it can bend the body forward protectively or even curl up into a 'ball' (Foetal position). In interaction with the release of endogenous substances such as adrenaline (energy: flight/fight) or dopamine (insensitivity to pain: flight/fight), it guarantees mobility or protection. In this respect, the condition of the psoas is an indicator of a person's personal 'sense of security' (relaxed and flexible or tense and rigid).

Whether a person has experienced a severe acute trauma (accident, injury, etc.) or a lighter but prolonged one - for example, through repeated physical abuse or fright with strong feelings of anxiety-these conditions have a direct effect on the mobility of the psoas. High levels of ongoing stress accompanied by the chemical changes in the body described above result in chronic tension with enormous effects on overall health. Becoming aware of and feeling the condition of one's psoas can bring a person into contact with their deepest fears but also with their potential solutions. The body 'remembers' trauma independently of our consciousness. That is why the final resolution of severe trauma is only possible in cooperation of body and mind (by this I mean consciousness and subconsciousness).

The vibrations produced by the exercises originate in the psoas and affect it directly. Starting from this powerful muscle in the centre of the body, the vibrations (neurogenic tremors) gradually spread throughout the body. We experience the gradual relaxation and regeneration of the psoas as ultimately relaxing the accompanying physiological changes are often described as 'strengthening', 'stability', 'security', running upright, standing, walking = courage and energy, flexibility etc [12].

The healing of the psoas is achieved through a combination of 'restoring the body's natural centre of gravity = balance' and learning the ability to listen inside the body. If you imagine the spine as a bundle of electrical wires that constantly receive and transmit energy in this image the psoas is the grounding. A relaxed and flexible psoas 'grounds' you, it connects you to the ground you are standing on.

A centred, balanced body feeling is comfortable for everyone, whether we are standing, running, jumping, climbing or sitting, and a healthy psoas works in conjunction with the pelvis to ensure this. The cornerstone of a healthy aligned skeleton is a balanced pelvis to support the spine, rib cage, neck and head. The pelvic bones support and transfer the weight of the body to the hip joints, legs, knees and feet. If the pelvis is not balanced, the pelvic bones cannot do this work and the psoas has to step in.

By starting to welcome daily life again without chronic tension, one automatically comes back to a more sensitive adaptation and perception of the inner body signals concerning safety and danger. From a rediscovered feeling of stability and security, one attains serenity and effortless access to the 'gut' = intuition. Through a balanced body feeling of strength and vitality, confidence in the self-healing powers grows, which in turn has a direct influence on our self-awareness [15].

The effect of the exercises

The physical exercises cause neurogenic tremors in the autonomic nervous system. This tremor allows the nervous system to release internal tensions as energy. The states of tension usually originate from attempted but unexecuted automatic reactions of flight or fight that have led to numbness and/or dissociation.

When flexor muscles such as the great lumbar vertebra (psoas) are

relaxed, this signals to the brain stem that there is no longer any danger. Basically, by doing the exercises, you allow yourself to return to your normal balanced and calm (and as far as the muscles are concerned, relaxed) state.

Neurogenic shaking brings the body physiologically into a state where we have a sense of 'safety' and are therefore more open to social interaction. Self-observation is also easier to achieve the ability to feel one's own body is objectively improved.

The role of the exercise leader enhances and accelerates the experiential process by guaranteeing the feeling of safety via 'social interaction' [6]. In psychotherapy this is called 'healing through encounter'.

The exercise sequence consists of six to 10 simple exercises through which the body's own discharge mechanism is activated. The neurogenic trembling is consciously experienced and controlled; everyone can adapt the process to their own needs and possibilities. In the second part of the article, I will present the exercise concept in concrete terms so that one can get guidance for practice from this.

Basic research results on TRE and autonomous selfregulation

The results of recent research projects hold promising therapeutic value insofar that there is evidence to support the ability of TRE and neurogenic tremors to reduce stress and anxiety and improve QoL (Quality of Life) [16, 17].

Nibel et al. state that statistically significant QoL gains were observed in the Life Enjoyment domain ($P < 0.05$) and for Overall Impressions in all five domains of the HW QoL questionnaire [18]. As participants incorporated SUTT into their routines on a regular basis, they reported more frequent positive emotions toward themselves and greater confidence in their ability to deal with adversity.

Data of several intervention studies in Germany and Ukraine were presented, comparing samples doing TRE exercises at the beginning and after 6 months plus and soldiers in a rehabilitation clinic compared to normal treatment. TRE (Tension release exercise) helps reducing symptoms, particularly sleeping disorders, head ache, digestion problems, chronic fatigue, tachycardia

Descriptive statistics showed an overall improvement in perceived stress (decrease in scores), flourishing (increase in scores), and pain self-efficacy (decrease in scores) [17].

Torres de Almeida et al. talk about comparing heart rate variability (HRV) before and after the intervention with TRE, it can be said that according to the time domain, frequency and linearity indices, there was an increase in HRV after the TRE [19]. A statistically significant average heart rate (M_{HR}) and average of the RR intervals M_{RR} are identified, indicating that there is an autonomic change, as it reduced the M_{HR} and respectively increases M_{RR} significantly after the application of TRE

The objective statistical results from HRV assessment along with the subjective descriptive results from the psychophysiological assessment showed that the TRE process, together with the participant taking a deeper breath during practice, improved emotional and mental states and reduced body tensions, thus increasing wellbeing [20].

Deuschl et al. have compiled a general overview of results from the field of body psychotherapy. It gives a good overview of relevant concepts and their effectiveness in practice [21].

Practical exercises

On the one hand, the exercises help to improve the presence in the here-and-now of the body. On the other hand, they loosen the psoas muscles in particular and promote the autonomous reactions of the body. These have the task of restoring the body's original vitality and resilience. All this supports personal well-being, self-awareness and self-strengthening. This also strengthens the much needed defences and a more realistic relationship to the surrounding reality.

The exercises can be done in the order suggested here. Practically, they serve to fatigue the deeply tense musculature. The better this is achieved, the easier it is for the body to react again in an independent

and self-regulated way, through trembling, vibrating, shaking, etc.

The exercises begin in a standing position, and are later continued in a lying position. These are some example exercises. There are many others that can be done in addition.

Doing the exercises is for body-self experience and is not psychotherapy. It is advisable and helpful to talk to a good friend or counsellor about your experiences during the exercises.

Basically the following series of exercises is helpful to work on the deep tension of the psoas-muscle and the herewith connected muscular system (see [supplementary material](#)).

Conclusion

Many people are traumatized or have had a traumatic experience. Globally seen, there has been a significant increase in the number of people with traumatic experiences, be it through domestic violence, accident, natural disaster, migration, or war. For many years there have been (psycho) therapeutic treatment options that are capable of alleviating or healing the effects of such experiences.

TRE (Tension release exercise) is a concept that has been practised in many countries, which adds some new aspects to the treatment and handling of traumatic experiences. It is also well proofed by scientific research. TRE represents a significant innovation in the field of psychotherapeutic or psychosomatic treatment and health maintenance and contributes an important dimension to quality of life (QoL):

- (1) TRE can be practically performed by everybody.
- (2) TRE works complementary / integrated to any psychotherapeutic treatment.
- (3) TRE works directly with the body and the embodiment of traumatic experience.
- (4) TRE also involves the muscle groups that are responsible for the fixation of the traumatic experience in the body (psoas muscle).
- (5) TRE also functions as a self-help concept and can therefore help people without the need to undergo psychotherapeutic treatment.

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